THE LONDON MATHEMATICAL SOCIETY

NEWSLETTER

No. 339 July 2005

Forthcoming Society Meetings

2005

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York
Northern Regional Meeting
O. Horodecki
C. Bennett
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Monday 5 September
Bristol
South West & South Wales Regional Meeting
T. Tao
V. Bergelson

Friday 7 October
London
Algorithms Meeting
M. Dyer
M. Jerrum

Friday 18 November
London
Annual General Meeting
F.C. Kirwan
B. Totaro

LMS PRIZES 2005

PÓLYA PRIZE

PROFESSOR SIR MICHAEL BERRY, FRS, of the University of Bristol is awarded the Pólya Prize in recognition of his many profound and highly innovative contributions to diverse areas of mathematics and mathematical physics.

He has made fundamental contributions and stimulated research in many directions, especially in optics, wave theory, quantum chaology, quantum mechanics and the Berry phase, asymptotics and the distribution of the zeros of the Riemann zeta function. He has identified and utilised inter-relationships between these areas in many beautiful ways. His exposition of science and mathematics in articles and lectures is inspirational both to specialists and to the general public.

SENIOR WHITEHEAD PRIZE

PROFESSOR KEITH MOFFATT, FRS, of the University of Cambridge is awarded the Senior Whitehead Prize for his outstanding contributions to applied mathematics, especially in the field of theoretical fluid mechanics. He is also honoured for his substantial and long-lasting influence on, and service to, the UK mathematics community.

Keith Moffatt's contributions to mathematical research have been profound and manifold, ranging from low Reynolds number flows at small scales, through turbulence modelling, to astrophysical fluid mechanics on the very large. He is also a dedicated and most effective teacher and lecturer, and he has given much time and energy over his career to national and international administrative duties, including the roles of Director of the Isaac Newton Institute for Mathematical Sciences (1996-2001) and President of the International Union of Theoretical and Applied Mechanics (2000-2004).

BERWICK PRIZE

DR IAIN GORDON of Glasgow University is awarded the Berwick Prize for his paper 'Baby Verma modules for rational Cherednik algebras', published in the *Bulletin* of the LMS **35** (2003), 321-336. This is a powerful contribution to the theory of symplectic reflection algebras, made by adapting techniques fundamental to the representation theory of Lie algebras in positive characteristic. The paper's new idea brought dramatic immediate success, answering many important questions of Etingof and Ginzburg, and the methods have the potential for much further progress.

WHITEHEAD PRIZES

PROFESSOR BEN GREEN of the University of Bristol is awarded a Whitehead Prize for his breakthrough results in combinatorics and combinatorial number theory. Much of his work is motivated by the general problem of finding arithmetic structures in particular sets. His results include an improvement of Bourgain's estimate of the size of arithmetic progressions in sumsets, a proof of the Cameron-Erdös conjecture on sum-free sets of natural numbers, and, following his proof that every set of primes of positive relative upper density contains an arithmetic progression of length three, a recent spectacular theorem with Terence Tao that the primes contain arbitrarily large arithmetic progressions.

DR BERND KIRCHHEIM of the University of Oxford is awarded a Whitehead Prize for his fundamental work in several areas of real analysis. His results in geometric measure theory include a proof that rectifiable metric spaces have density one, a metric differentiation theorem, and a surprisingly powerful extension with Ambrosio of the Federer-Fleming theory of currents to general metric spaces. His results in the calculus of variations include a proof that the quasiconvex envelope of a continuously differentiable function remains continuously differentiable and a complete solution to the problem of existence of non-trivial Lipschitz self-maps of the plane whose gradients attain only finitely many values.

PROFESSOR NEIL STRICKLAND of the University of Sheffield is awarded a Whitehead Prize for his contributions to algebraic topology. He is an outstanding algebraic topologist, who has contributed significantly to most areas of the subject. His main achievements have been in developing and extending the use of the methods of the theory of formal groups in homotopy theory, and especially in applying them to study elliptic cohomology theories.

DR PETER TOPPING of the University of Warwick is awarded a Whitehead Prize for his work on non-linear partial differential equations in geometric analysis. He has made especially important progress in the study of singular behaviour of the harmonic map heat flow in two spatial dimensions by showing that the singular behaviour is unique in great generality and constructing new solutions permitting full understanding of the significance of the condition of monotonicity of energy in the previous existence and uniqueness results. He proved the first results on exponential rates of convergence for the harmonic heat flow in the presence of singularities at infinity.

LMS Newsletter

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FELLOWS OF THE ROYAL SOCIETY

Amongst those elected to Fellowship of the Royal Society in May 2005 were: Professor Martin Barlow (University of British Columbia), Professor David Masser (Universität Basel), Professor Nicholas Trefethen (University of Oxford), Professor Richard Ward (University of Durham). Professor Raoul Bott (Harvard University) was elected a Foreign Member.

CECIL KING TRAVEL SCHOLARSHIP AWARD

The 2005 Cecil King Travel Scholarship has been awarded to Alexander Paulin, a PhD student at Imperial College. The London Mathematical Society makes the award of up £5,000 annually to a young mathematician of outstanding promise, to support a period of study or research abroad for a typical period of three months. Alexander will use the Scholarship to fund a trip to Harvard in early 2006, during a period when world experts in *p*-adic modular forms will be working together, including his PhD supervisor Professor Kevin Buzzard. In keeping with the recent emergence of a *p*-adic Langlands program, he hopes to investigate the geometry and representation theory of various *p*-adic automorphic forms.

SIR EDWARD MAITLAND WRIGHT (1906 – 2005)

Principal and Vice-Chancellor of the University of Aberdeen (1962-76) and Professor of Mathematics (1935-62). Member of the London Mathematical Society 1929-2005.

A Memorial Service for Sir Edward Maitland Wright MA, DPhil, LLD, DSc, FRSE who died on 2 February 2005 will be held in King's College Chapel, University of Aberdeen at 3.00 pm on Friday 7 October 2005. All friends and colleagues are invited both to the service and the subsequent reception; please be seated in the Chapel by 2.45 pm. Contact Mrs Debra Buchan on 01224 272689 or email d.buchan@abdn.ac.uk if you wish to attend.

NEWS FROM ACME

The Advisory Committee on Mathematics Education's (ACME) feasibility study on ensuring a high quality 'local offer' in Continuing Professional Development in mathematics, as part of the planned establishment of the National Centre for Excellence in the Teaching of Mathematics (NCETM), has now come to an end. A final report has been submitted to DfES and it is expected that it will be published soon. See: www.royalsoc.ac.uk/acme/mathsteaching.htm for further details.

A summary of the key themes raised at the QCA/ACME workshop on functional mathematics, held on 3 March 2005, is available on the ACME website. ACME is continuing to represent the views of the mathematics community on the QCA Post14 Mathematics Advisory Group. See: www.royalsoc.ac.uk/acme/post14.htm.

Notes on past meetings of ACME and details of future meetings can be found at: www.royalsoc.ac.uk/acme/whatsHappening.htm.

NEWS FROM THE INTERNATIONAL MATHEMATICAL UNION

African Mathematical Union

Issue 30 of the Newsletter of the African Mathematical Union Commission on the History of Mathematics in Africa (AMUCHMA) has appeared. This issue contains a (first) list of over 600 examples of African doctorates in mathematics, mathematics education and the history of mathematics. AMUCHMA webpage: www.math.buffalo.edu/mad/AMU/amuchma_online.html.

IMU on the web

In mid-April, the MSRI at Berkeley held a workshop on digitizing the mathematical literature. A model instance of what 'retronumerisation' (that's franglais) can create is instanced by the work at Grenoble, see www.numdam.org.

The IMU's vision of a World Digital Mathematics Library is partly encapsulated by the draft statement at www.ceic.math.ca/News/IMUonWeb.shtml#CEIC8. I hope soon to be able to use IMU on the web to provide you with the agreed endorsed IMU statement better summarising the goals of the project. The greatest inhibition to the vision of retrodigitizing all the old literature sadly is that of copyright. In that context, http://aaupnet.org/aboutup/issues/0865_001.pdf makes fascinating reading. Where do you (as likely both writer and reader) stand on these matters?

The greatest benefit of digitization is ready immediate access; see the interesting news at www.nature.com/nature/focus/accessdebate/17.html and no: because of copyright reasons I cannot guarantee that that URL is a lasting one.

Alf van der Poorten
on behalf of the CEIC

KHACHIYAN AND DANTZIG

Mathematics interfaces with the real world in more ways than most of us realize. Many products and services which have a 'mathematical ingredient', i.e. mathematical modelling, mathematical simulation, or the application of mathematical software have been utilized in the design and/or production process. In economic terms, mathematics has become a production factor.

One of the great achievements of the 20th century in this respect was the invention and development of linear programming (and its subsequent extensions to nonlinear, integer, and stochastic programming). Whenever you fly an airplane, ride a public bus, make a phone call, buy sausages or gasoline , receive a letter, or try to get a loan, somewhere in the supply chain some linear programs will have been solved. Today, there is excellent commercial (and even open source) software available that can handle linear programs with millions of variables and constraints.

The economic impact of linear programming was honoured with a Nobel Prize awarded to L.V. Kantorovich and T.C. Koopmans in 1975. The mathematical foundation of linear programming was laid in 1947 by George B. Dantzig with the invention of the Simplex Method. Optimizers view Dantzig as the 'father of linear programming'. It remains an open problem to this day as to whether there exists a polynomial time version of the Simplex Method. In 1979 Leonid G. Khachiyan employed, in a very surprising way, the Ellipsoid Method to prove that linear programs can be solved in polynomial time, a result that has triggered intensified interest in LP algorithms.

These two leading figures of optimization passed away within the couple of months. Leonid Khachiyan died on 29 April, aged 52, and George Dantzig on 13 May, aged 90. They both will be remembered forever for their contributions to optimization theory and practice.

LONDON MATHEMATICAL SOCIETY

NORTHERN REGIONAL MEETING

Room B002, Biology Building, University of York

Friday 8 July 2005

2.00 pm **LMS business meeting**

2.15 pm **Pawel Horodecki (Gdansk)**
Quantum communication and entanglement: selected phenomena and open problems

3.15 pm **Tea**

3.45 pm **Charles Bennett (IBM)**
Information is quantum (provisional)

5.00 pm **Open discussion on the LMS-IMA Frameworks Study Initiative**

There are limited funds available to contribute in part to the expenses of members of the Society or research students to attend the Society meeting on Friday 8 July. Requests for support, including an estimate of expenses, may be addressed to the Programme Secretary at the Society (web: www.lms.ac.uk; email: grants@lms.ac.uk).

A dinner preceding the meeting will be held on Thursday 7 July. Contact the conference organiser Tony Sudbery (as2@york.ac.uk) if you wish to attend the dinner.

The meeting will be preceded by a workshop on *Quantum Information Theory*, from 6-8 July.

FERRAN SUNYER I BALAGUER PRIZE 2006

Ferran Sunyer i Balaguer (1912-1967) was a self-taught Catalan mathematician who, in spite of a serious physical disability, was very active in research in classical Mathematical Analysis, an area in which he acquired international recognition. Each year in honour of the memory of Ferran Sunyer i Balaguer, the Fundació Ferran Sunyer i Balaguer awards an international mathematical research prize bearing his name, open to all mathematicians. This prize was awarded for the first time in April 1993.

Conditions of the prize

The prize will be awarded for a mathematical monograph of an expository nature presenting the latest developments in an active area of research in Mathematics, in which the applicant has made important contributions. The monograph must be original, written in English, and of at least 150 pages. The monograph must not be subject to any previous copyright agreement. In exceptional cases, manuscripts in other languages may be considered. The prize, amounting to €12,000, is provided by the Ferran Sunyer i Balaguer Foundation. The winning monograph will be published in Birkhäuser Verlag's series 'Progress in Mathematics', subject to the usual regulations concerning copyright and author's rights. The submission of a monograph implies the acceptance of all of the above conditions. The name of the prize-winner will be announced in Barcelona in April 2006.

Scientific committee

The winner of the prize will be proposed by the Scientific Committee:

- A. Córdoba (Universidad Autónoma de Madrid)
- P. Malliavin (Université de Paris VI)
- J. Oesterlé (Institut de Mathématiques de Jussieu)
- O. Serra (Universitat Politècnica de Catalunya)
- A. Weinstein (University of California at Berkeley).

Submission

Monographs should preferably be typeset in TeX. Authors should send a hard copy of the manuscript and a disk with the DVI and PS (PostScript) files enclosing an accompanying letter to the Ferran Sunyer i Balaguer Foundation. Submissions should be sent by 2 December 2005, to Fundació Ferran Sunyer i Balaguer, Carrer del Carme 47, E-08001 Barcelona, Spain (ffsb@crm.es).

Recent winners

- Antonio Ambrosetti and Andrea Malchiodi *Perturbation methods and semilinear elliptic problems on R^n* (2005)
- José Seade *On the topology of isolated singularities in analytic spaces* (2005)
- Guy David *Singular sets of minimizers for the Mumford-Shah functional* (2004)
- F. Andreu-Vaillo, V. Casellas and J.M. Mazón *Parabolic quasilinear equations minimizing linear growth functionals* (2003)
- André Unterberger *Automorphic pseudo-differential analysis and higher-level Weyl calculi* (2002)
- Alexander Lubotzky and Dan Segal *Subgroup growth* (2002)
- Martin Golubitsky and Ian Stewart *The symmetry perspective* (2001)
- Juan-Pablo Ortega and Tudor Ratiu *Hamiltonian singular reduction* (2000)

NEVILLE MELFI

Dr Neville A. Melfi, who was elected a member of the London Mathematical Society on 8 May 1981, died on 23 February 2005.

MATHEMATICAL SOCIETY OF JAPAN

Professor Sadayoshi Kojima was elected as President of the Mathematical Society of Japan, as the successor of Professor Yasuo Morita. The London Mathematical Society has a reciprocity agreement with the Mathematical Society of Japan (34-8 Taito 1-chome, Taito-ku, Tokyo 110-0016 Japan; tel: 03 3835 3483, fax 03 3835 3485).

IMA–LMS FRAMEWORKS STUDY INITIATIVE

The Councils are keen to receive comments on the issues in the Frameworks Report. Send your views by email to: fsi@ima.org.uk or fsi@lms.ac.uk

Further Open Meetings planned:

- 8 July (York) – 5.00 pm, Room B002, Biology Building, University of York, as part of the LMS Northern Regional Meeting
- 5 September (Bristol) – 5.00 pm, School of Mathematics, University of Bristol, as part of the LMS South-West and South Wales Regional Meeting
- 13 September (Glasgow) – 6.30 pm, Lecture Theatre A005, Glasgow Caledonian University following the IMA Scottish Branch Annual Schools Day (details to be confirmed)
- 20 September (London) 4.00 pm, De Morgan House
- 27 September (Manchester) as part of the IMA Lancashire and NW Branch meeting (further details to be confirmed)

BOLOGNA PROCESS

Bergen Meeting

Ministers from forty or so European countries met in Bergen in May (www.bologna-bergen2005.no) to take forward the Bologna process, which seeks to establish common degree names and some measure of compatibility between those degrees in the countries involved. This has meant major changes for many of our European colleagues, but very little, so far, for UK mathematicians.

The meeting in Bergen reinforces this general picture. Doctoral programmes are now included, but the model for these is one to which UK practice largely conforms. Various matters have been hotly debated in the run up to the meeting, but the outcomes seem, at least to me, to be sensible. For instance, PhD programmes should take 3-4 years, full-time equivalent; mobility of doctoral students is encouraged but programmes are not broken down into credit-bearing parts; diversity of practice is recognised.

For undergraduate programmes, attempts to encourage, or even impose, common syllabuses seem to have been kicked into the long grass. The proposed overarching qualifications framework is mostly harmless and is firmly subject-based. We still have a problem about fitting undergraduate Masters degrees into the Bologna scheme, but so do other scientific and engineering disciplines.

David Salinger

VISIT OF PROFESSOR M. FELLOWS

Professor Michael Fellows (University of Newcastle, Australia) is visiting the UK during June and July. His visit is partially supported by an LMS Scheme 2 grant. At 12 noon on 10 July he will give a lecture titled *Fixed-parameter tractability is polynomial-time extremal structure theory* as part of the Algorithms and Complexity in Durham 2005 Workshop (www.dur.ac.uk/acid.2005). People not attending the workshop can attend this talk without any charge. It will take place at Collingwood College, South Road, Durham DH1 3LT. The talk is scheduled at the very end of the workshop to enable the attendance of mathematicians who attend the British Combinatorial Conference. The BCC takes place in Durham and starts on 10 July (http://mcs.open.ac.uk/bcc2005). For further information contact Stefan Szeider, Department of Computer Science, Durham University (tel: 0191 3341 759, email stefan.szeider@durham.ac.uk).

LONDON MATHEMATICAL SOCIETY

SOUTH WEST & SOUTH WALES REGIONAL MEETING

School of Mathematics, University of Bristol

Monday 5 September 2005

2.00 pm **LMS business meeting**

2.15 pm **Vitaly Bergelson (Ohio State)**
Ergodic Ramsey Theory and properties of large sets

3.15 pm **Tea**

4.00 pm **Terence Tao (UCLA)**
Ergodic theory, arithmetic progressions and the primes

5.00 pm **Open discussion on the LMS-IMA Frameworks Study Initiative**

There will be a reception and dinner afterwards. For further details and to reserve a place at the dinner, contact Cathy Badley (Cathy.Badley@bristol.ac.uk).

There are limited funds available to contribute in part to the expenses of members of the Society or research students to attend the Society meeting on Monday 5 September. Requests for support, including an estimate of expenses, may be addressed to the Programme Secretary at the Society (web: www.lms.ac.uk; email: grants@lms.ac.uk).

This will be followed by a workshop on *Additive Combinatorics*, focusing on recent developments concerning arithmetic progressions, 5 – 9 September. The interplay between ergodic theory and combinatorics/harmonic analysis will be a particular focus of the workshop. Further information is on the web at: www.maths.bris.ac.uk/~mabjg/bristolworkshop.html or contact the organizer Ben Green, School of Mathematics, University of Bristol (B.J.Green@bristol.ac.uk).

UNIVERSITY OF CAMBRIDGE

FACULTY OF MATHEMATICS

ADAMS PRIZE

Mathematical Biology

The Chairman of the Adjudicators for the Adams Prize invites applications. The Prize will be awarded this year for research achievement in the field of Mathematical Biology, interpreted in the broadest sense.

The prize is open to any person who, on 31 October 2005, will hold an appointment in the UK, either in a university or in some other institution; and who is under 40 (in exceptional circumstances the Adjudicators may relax this age limit). The value of the prize is expected to be approximately £15,000; of which one third is awarded to the prize-winner on announcement of the prize, one third is provided to the prize-winner's institution (for research expenses of the prize-winner) and one third is awarded to the prize-winner on acceptance for publication in an internationally recognised journal of a substantial (normally at least 25 printed pages) original article, of which the prize-winner is an author, surveying a significant part of the winner's field.

Applications (seven copies), comprising a CV, a list of publications, the work or works (published or unpublished) to be considered, and a brief non-technical summary of the most significant new results of these works (designed for mathematicians not working in the subject area) should be sent to:

The Secretary of the Adams Prize Adjudicators,
Faculty Office, Centre for Mathematical Sciences,
Wilberforce Road, Cambridge, CB3 0WA

(enquiries may be emailed to: faculty@maths.cam.ac.uk).

The deadline for receipt of applications is **31 October 2005**.

LMS PROGRAMME AND CONFERENCE FUND

The Programme and Conference Fund is used to give financial support for mathematical research in the UK. The fund is administered by the LMS Programme Committee, which distributes as grants some of the funds that the Society receives from its investments and publishing activities. This is one of the mechanisms through which the Society achieves its central purpose, namely to 'promote and extend mathematical knowledge'. The Society operates as a charity and does not receive any public funding. Thus Programme Committee has different opportunities and works within a different regulatory framework from other funding bodies, such as the EPSRC. Grants are made under six schemes which are described on the LMS website (www.lms.ac.uk/activities/prog_com/index.html).

Please note that Programme Committee's budget is under pressure, and we are not always able to make awards as fully as we would like.

How to apply

For Schemes 1-5 application forms may be obtained from the Society's Office or may be downloaded as rich text files from the LMS website (www.lms.ac.uk/activities/prog_com/index.html). For Scheme 6 applications should be made by letter.

Applications should be set out clearly, and preferably typed. They should be self-contained; please do not append substantial documents that contain irrelevant detail or refer to websites for key information. Where a CV is requested it should be no more than two sides of A4.

Grants must be claimed in a specified financial year from 1 September to 31 August. Please ensure that you state in your application in which year you intend to claim the grant, bearing in mind that grants should normally be claimed not earlier than 3 months before, and not later than 3 months after, the event for which the grant is made.

Please send all applications in hard copy to the Programme Secretary at De Morgan House.

Who may apply

Any mathematician working in the UK is eligible to apply for a grant, but if the applicant is not a member then the application must be countersigned by an LMS member.

When to apply

Please note that applications will not be considered between mid-June and mid-September. The main meetings of the Committee are held in February and September. Additional meetings are held in between, but time at these is very limited and it cannot be guaranteed that your application will be considered. For the date of the next meeting please contact Sylvia Daly (grants@lms.ac.uk), but above all please note that some of the individual schemes have their own deadlines: these are detailed under the headings for each scheme.

Assistance

Queries regarding applications can be addressed to the Programme Secretary, Stephen Huggett (tel: 01752 232710, email: s.huggett@plymouth.ac.uk) or Sylvia Daly (tel: 020 7291 9971 email: grants@lms.ac.uk), who will be pleased to discuss proposals informally with potential applicants and give advice on the submission of an application.

Notes for Guidance

Applicants should keep in mind the following points:

1. The Society does not like to receive sequential applications for grants to support the same or closely related events, and will not allow its limits for individual schemes to be exceeded by artificially sub-dividing an application into a number of separate requests under different headings.
2. The committee does not normally meet the full cost of an activity. Rather it aims to give added value to an event largely funded by other means, or to bridge the

gap between cost and the resources that might reasonably be made available by a university department.

3. The grants do not cover departmental overheads. The committee will generally not allow items such as secretarial costs, which could be seen as part of normal departmental provision, or entertainment.
4. Applicants should note that our mileage rate is 23p.
5. Each of the schemes has a particular aim as well as its own financial limits. It is helpful if applicants consider carefully how their proposal fits the particular scheme in question, and its detailed rules (which change from time to time). Thus the academic justification for a Scheme 2 grant should focus on the benefit to UK mathematics that the proposed visit would bring, while that for a Scheme 5 grant should focus on the benefits in the Scheme 5 country. In neither case should it be assumed that the distinction of the visitor renders further justification unnecessary.
6. The committee is made up of mathematicians with a wide spread of research interests, but it should not be assumed that they are familiar with the technical details of any particular area of mathematics. Proposals are judged by the committee itself: although it may seek advice, it does not normally send proposals to referees. It is therefore important that the case for a grant should be written for the general mathematician and not for the specialist.
7. The committee judges each application on its merits. Since its membership changes from year to year, it should not be assumed that it is familiar with the details of previous applications and correspondence from earlier rounds; nor should it be assumed that a grant, for example under Scheme 3 or for a regular collaboration under Scheme 4, will be renewed repeatedly.
8. The limits mentioned in the various schemes are upper bounds, not standard awards. Grants are made to meet actual expenditure on items in the application, and any surplus must be returned to the Society, rather than retained for related purposes or carried forward to another year.
9. The task of collating applications, forwarding them to the committee, recording decisions, and preparing and checking notification letters is nontrivial and time-consuming. Please apply well in advance and bear in mind that you may not hear the outcome of an application immediately.

Grants awarded from November 2004 to May 2005

Scheme 1

Applicant	Title	Grant
M.J. Grannell	20th British Combinatorial Conference	£1,000
M.R.E. Proctor	Turbulence, Twist and Treacle: A meeting in celebration of the 70th birthday of H.K. Moffatt	£4,000
A.Y. Lazarev	20th British Topology Meeting	£3,600
N.J. Young Z.A. Lykova	BMC 2006	£10,000
A.J.W. Hilton	Reading One-Day Combinatorics Colloquium	£460

Scheme 1 (cont'd)

Applicant	Title	Grant
C. Gundlach	New Directions in Numerical Relativity (INI Satellite Meeting)	£3,330
M. Mathieu	Belfast Functional Analysis Day 2005	£815
Y.V. Kurylev	Workshop on Applied Inverse Problems 2005	£1,940
K. Chen	5th UK Conference on Boundary Integral Methods	£2,000
N. Heuer	BICOM Workshop on Boundary Elements	£3,640
I. Gordon	Scottish Algebra Day	£1,460
M. Ruzhansky	Fourier Analysis and Hyperbolic PDEs	£4,000
D.M. Evans	Workshop on Pure Model Theory	£2,000
S. Dantchev	Algorithms and Complexity in Durham	£1,860
M. Marletta	Mathematical Software in Applied Mathematics	£1,585
G.W. Roberts	The University of Wales Gregynog Mathematics Colloquium	£1,835
A. Gorban	Model Reduction and Coarse-Graining Approaches for Multiscale Phenomena	£2,000
P. Welch	British Logic Colloquium 2005	£2,800
K. Goda	7th Annual Postgraduate Group Theory Conference	£2,507
C.M. Campbell E.F. Robertson	Groups St Andrews 2005	£3,000
A. Fring	9th Annual UK Meeting on Integrable Models, Conformal Field Theory and Related Topics	£2,310

Scheme 2

Applicant	Visitor	To Visit	Grant
A. Premet	Y. Bahturin	Manchester, Leicester, Oxford	£1,200
A.W. Mason	P. Zalesskii	Glasgow, Manchester, QMUL	£1,200
A.B. Piunovskiy	E.A. Feinberg	Bristol, Cambridge, Liverpool	£1,150
E.V. Ferapontov	M. Pavlov	Loughborough, Leeds, Imperial College	£1,100

cont'd

Scheme 2 (cont'd)

Applicant	Visitor	To Visit	Grant
K.R. Khusnutdinova	A. M. Samsonov	Leeds, Keele, Loughborough	£1,050
C. Series	R. Kellerhals	Durham, Warwick, Southampton	£850
J. Saxl	J.H. Conway	Cambridge, Birmingham, Warwick, Oxford	£545
R.H.J. Grimshaw	E.N. Pelinovsky, T. Talipova	Loughborough, Sheffield, Hull	£1,200
C.A. Beck	E. Cohen	QMUL, Bristol, Manchester	£740
Z. Qian	M. Ledoux	Imperial College, Warwick, Oxford, Cambridge	£1,000
J. Schröer	J. Xiao	Leeds, York, Manchester	£700
E.B. Davies	B. Simon	Cambridge, Swansea, London	£1,124
A.P. Veselov	V. Adler	Loughborough, Leeds, Imperial College	£1,100
H.G. Dales	A.Y. Helemskii	Leeds, University College London, Southampton	£850
P.M. Sutcliffe	M. Paranjape	Kent, Cambridge, Durham	£1,170
V.B. Kuznetsov	I.V. Komarov	York, Leeds, Loughborough	£1,000
S. Szeider	M.R. Fellows	Royal Holloway, Oxford, Durham	£1,200
S.E. Rees	A. Martino	Newcastle, Heriot-Watt, Glasgow	£847
A. Mikhailov	G. Shabat	Leeds, Loughborough, Southampton	£1,150
J-L. Wu	J-A. Yan	Manchester, Swansea, Oxford, Loughborough, Warwick	£900
C.J. Read	F. Ghahramani	Leeds, Newcastle, Lancaster	£880
N.J. Laustsen	R.J. Loy	Newcastle, Lancaster, Leeds	£1,200
S.E. Rees	S. Cleary	Newcastle, Edinburgh, Glasgow	£632
E.V. Ferapontov	M. Blaszak	Loughborough, Leeds, Imperial College	£1,150
A.J. Duncan	A.G. Myasnikov	QMUL, Newcastle, Manchester	£390
H. Bruin	S. Vaienti	Surrey, Exeter, Imperial College	£980

Scheme 2 (cont'd)

Applicant	Visitor	To Visit	Grant
D.G. Larman	K. Swanepoel	Oxford, University College London, Cambridge	£515
J.P. Wang	J.A. Sanders	Lancaster, Leeds, Kent	£950
M. Nazarov	D. Lebedev	York, Loughborough, Durham	£1,000
J.P.C. Greenlees	S.B. Iyengar	Sheffield, Leicester, Leeds	£968
S. Bullett	R.L. Devaney	QMUL, Warwick, Open	£1,200

Scheme 3

Applicant	Institution	Title	Grant
R. Hoyle	Surrey	Patterns, Nonlinear Dynamics and Applications (PANDA). Amended Award.	£1,200
T. Brzezinski	Swansea	QMW-Swansea-Warwick joint research group: Quantum Geometry of Hopf Algebras and Hopf Algebroids	£900
S.D. Galbraith	Royal Holloway	SECANTS	£600
I. Gordon	Glasgow	Algebra and Representation Theory in the North (ARTIN)	£900
G. Sankaran	Bath	Calf Algebraic Geometry Seminar	£600

Scheme 4

Applicant	Institution	Collaborator	Institution	Grant
E.V. Ferapontov	Loughborough	S.P. Tsarev	Krasnoyarsk State Pedagogical, Russia	£250
D. Kahrobaei	St Andrews	E. Ghys, E. Breuillard	Ecole Normale Superieure de Lyon, IHES	£500
J. Grbic	Aberdeen	V. Buchstaber T. Panov	Steklov Institute, Moscow State	£500
M.R. Pistorius	King's College London	F. Avram	Pau, France	£450

cont'd

Scheme 4 (cont'd)

Applicant	Institution	Collaborator	Institution	Grant
P. Butkovic	Birmingham	K. Zimmermann	Charles, Prague	£500
E. Winstanley	Sheffield	A. Ottewill, E. Radu	Dublin, Maynooth	£500
P.J. Rowley	Manchester	C. Parker	Birmingham	£250
J.C. Wood	Leeds	L. Fernández	Universidad de los Andes, Colombia	£500
B. Zegarlinski	Imperial College	R. Olkiewicz	Wroclaw, Poland	£500
G.A. Jones	Southampton	J. Wolfart	J-W Goethe, Frankfurt	£500
A. Movchan	Liverpool	R.C. McPhedran	Sydney	£500
V.C. Mavron	Aberystwyth	J.D. Key	Clemson, Aberystwyth	£500
M. Feigin	Imperial College	Y. Burman	Independent University of Moscow	£400
N. Heuer	Brunel	A. Bespalov	Russian Academy of Sciences	£500
C. Christopher	Plymouth	D. Schlomiuk	Montreal	£350
J.C. Wood	Leeds	D. Krupka, O. Krupkova	Palacky, Olomouc, Czech Republic	£500
J. Siemons	UEA	E. Konstantinova	Sobolev Institute of Mathematics, Russia	£500

Scheme 5

Applicant	Visitor/Institution	To Visit	Grant
R.M. Williams	G.F.R. Ellis (Cape Town)	Cape Town, AIMS	£1,150
W.J. Harvey	R. Kulkarni (Harish Chandra Institute, India)	Harish Chandra Institute, India	£600
K. Brown (I. Gordon, S. Majid, J. Rawnsley)	Representation Theory in Differential Geometry & Physics Workshop	Benin	£4,800
S.C. Power	R. El-Harti (Hassan, Morocco)	Lancaster	£1,625

ICM 2006

Satellite conferences

Four more satellite conferences approved by the Executive Committee of ICM 2006:

- *Methods of integrable systems in geometry*, Durham, UK,12-20 August, contact John Bolton (john.bolton@durham.ac.uk)
- *Trends and challenges in calculus of variations and its applications*, UCLM, Toledo, Spain, 16-19 August, contact José Carlos Bellido (JoseCarlos.Bellido@uclm.es)
- *Conference on routing and location* 2006 (CORAL 2006), Puerto de la Cruz, Tenerife, 14-17 September, contact Juan José Salazar (jjsalaza@ull.es)
- *Algebraic Geometry*, Segovia, Spain, 16-19 August, contact Raquel Mallabibarrena (raquelm@mat.ucm.es)

Visit www.icm2006.org for further information.

COMBINATORICS, AUTOMATA AND NUMBER THEORY

An international school and conference on Combinatorics, Automata and Number Theory (CANT2006) will be held in the Department of Mathematics, University of Liège, Belgium from 8-19 May 2006. The proposed international school is aimed at presenting and developing recent trends in Combinatorics (with emphasis on Combinatorics on Words), Automata Theory and Number Theory. On the one hand, the newest results in these areas shall benefit from a synthetic exposition, and on the other hand, emphasis on the connections existing between the main topics of the school will be sought. Concurrently with the school, there will be an international conference focusing on the same topics. Courses and lectures will be organized in the morning, while the afternoon sessions will be devoted to the conference. The main invited speakers are:

- J.-P. Allouche (CNRS, Université Paris-Sud)
- Y. Bugeaud (University of Strasbourg)
- F. Durand (University of Picardie, Amiens)
- P. Grabner (Technical University of Graz)
- J. Karhumäki (Turku University)
- H. Prodinger (University of Stellenbosch)
- J. Sakarovitch (CNRS, ENS Télécom.)
- J. Shallit (University of Waterloo)
- B. Solomyak (University of Washington)
- W. Thomas (RWTH, Aachen)

There will be five invited lecturers per week. Participants can decide to attend one of the two weeks of this event. Talks will be selected on the basis of an extended abstract (maximum six pages). Deadline for the submission of abstracts is **1 April 2006**. More details will be available in due time on the conference website www.cant2006.ulg.ac.be or email M.Rigo@ulg.ac.be.

UNIÓN MATEMÁTICA DE AMÉRICA LATINA Y EL CARIBE

Two congresses under the auspices of Unión Matemática de América Latina y el Caribe (UMALCA):

- The XIV ELAM (Escuela Latino Americana de Matemática, Latin American School of Mathematics) will take place in Solis, Uruguay, from 1-9 December 2005. ELAM is one of the main mathematical events in Latin America, and this edition is devoted to Probability and Dynamical Systems. Visit http://imerl.fing.edu.uy/elam for further information.
- The Latin American Mathematical Union (UMALCA), the European Mathematical Society (EMS), the Society for Industrial and Applied Mathematics (SIAM), and the Société pour les Mathématiques Appliquées et Industrielles (SMAI) are organizing an International Congress of Applied Mathematics to be held at the Center for Mathematical Modelling (CMM), Universidad de Chile, in Santiago de Chile on 13-17 March 2006.

FUNCTION THEORY MEETING

The annual one day Function Theory Meeting will be held on Monday 19 September, in the Hardy Room of the London Mathematical Society building, De Morgan House, Russell Square, London WC1B 4HS. There will be six talks, preceded by coffee at 10.30, and with breaks for lunch and tea.

- Darren Crowdy (Imperial College London) *New formulae for Schwarz-Christoffel mappings to multiply-connected polygonal domains*
- Alastair Fletcher (Warwick) *Local rigidity of infinite-dimensional Teichmüller spaces*
- Tom Tyler (Greenwich (retired)) *The Hadamard-Hayman constant*
- Giannis Platis (Durham) *Developments on complex hyperbolic quasi-fuchsian space*
- Jim Langley (Nottingham) *Integer points of entire functions*
- Edward Fraenkel (Bath) *Resolution of a question concerning the entry of a wedge into water*

The meeting is supported by an LMS conference grant. For further information contact the organiser Anthony G. (Tony) O'Farrell, Mathematics Department, NUI, Maynooth, Co. Kildare, Ireland (Anthony.OFarrell@nuim.ie).

LUMS INTERNATIONAL CONFERENCE ON MATHEMATICS

LUMS International Conference on Mathematics 2005 (LICM05) will be organized by Lahore University of Management Sciences, which will be held in Lahore, Pakistan from 27-30 November, 2005. The conference is devoted to recent advances in all areas of mathematics. The chief aim is to attract and bring together researchers for useful discussion and future collaboration. It is open to researchers world-wide. The organizers invite the submission of short abstract, presenting original research or substantial work in any area of mathematics. There will be young speakers' awards for PhD students and overall best speaker award. The key-note speakers will include:

- Alexandru Dimca (France)
- Ioan Tomesco (Romania)
- Mark Bashmakov (Russia)
- Arif Zaman (Pakistan)
- Irene Scirich (Malta)
- Tetsuo Ida (Japan)

and invited speakers will include

- Jafar Biazar (Iran)
- Rajesh Bawa (India)
- Suthep Suantai (Thailand)

For further information and to complete the registration form online, visit the website at http://web.lums.edu.pk/~licm05 or write to Dr Faqir M Bhatti, Convener of LICM05, Department of Mathematics, School of Arts and Sciences, Lahore University of Management Sciences, Sector U, DHA, Lahore 54792, Pakistan (email: fmbhatti@lums.edu.pk, tel +92-42-5722670 ext 2123 or 2121).

EUCLID AND HIS HERITAGE

A Clay Mathematics Institute Conference on Euclid and his Heritage will be held from 7-8 October in the Bernard Sunley Lecture Theatre, St Catherine's College, Oxford. The conference is on the occasion of the publication, for the first time, of a complete digital edition of the oldest surviving manuscript of Euclid's *Elements*. Written around 300 BC, this is the founding document of mathematics. The manuscript, dating from the year 888 AD, was copied by Stephen the Clerk in Constantinople, and since 1804 has been in the collection of the Bodleian Library. The digital edition was prepared by the Octavo corporation, which photographed the manuscript at the Bodleian in the autumn of 2004.

The conference will bring together classicists, historians, mathematicians and philosophers to provide a fresh look at Euclid's work, the transmission of Greek science from ancient to modern times, and the influence over twenty three centuries of the Greek revolution in mathematics – the body of knowledge in the form of an axiomatic system.

The conference is open to all – those in the research and scholarly communities as well as anyone with an interest in the origins and development of scientific thought. For more information visit: www.claymath.org/euclid.

HURDLES AND STRATEGIES

"Why do they write $a^2+a^3 = a^5$ and $3(x+4) = 3x+4$ and ...?" As all teachers of mathematics will know, the teaching of algebra is not straightforward and mistakes like these occur all too often. This book looks at, and tries to provide constructive suggestions to resolve, a wide range of errors like these.

The basis for the book comes from lists of questions about the teaching of algebra in general, or algebraic manipulation in particular which were submitted by experienced mathematics teachers across the country for which they felt answers/suggestions would be of value. The topics, which included items that the teachers found challenging as well as questions they had been asked by colleagues or had been discussed at a departmental meeting, were collated and sent round with the invitation to submit strategies, suggestions or comments that people had found to be practically useful. It is hoped that the contents of this book will provide a stimulus for debate as well as constructive suggestions for dealing with tricky issues.

Hurdles and Strategies in the Teaching of Algebra collated by Tony Barnard (King's College London) is available from the Mathematical Association (259 London Road, Leicester LE2 3BE, email: Enquiry@MA.org.uk). The price for MA members is £6.00 and for non members £9.00.

RECORDS OF PROCEEDINGS AT MEETINGS

REGIONAL ORDINARY MEETING

held on *Wednesday 18 May 2005* at the University of Birmingham. About 80 members and visitors were present for all or part of the meeting.

The meeting began at 2:20 pm, with Professor F.C. KIRWAN, FRS, in the Chair. Seven people were elected to Ordinary Membership: N.D.A. Aparicio, J.J. Bevan, A.M.G. Cox, M. Feigin, E. Garcia, P. Grindrod, D.M. Leppinen; four people were elected to Associate Membership: H. Aziz, A.E. Hamilton, H.R. Hill, A.M. Kasprzyk; and two people were elected to Reciprocity Membership: W.B. Hart and K. Kitazaki.

The Record of the Proceedings of the Society Meeting held on 25 February 2005 was signed as a correct record.

Three members signed the book and were admitted to the Society.

Dr C. Parker introduced the Fröhlich Lecture given by Professor R. Oliver on *p-local structure of finite groups and of their classifying spaces*.

Dr C. Parker introduced a lecture given by Professor W.T. Gowers on *Is there another way to explain mathematics?*.

Dr P. Flavell introduced a lecture given by Professor S. Smith on *Homology decompositions from subgroup complexes of finite groups*.

The prize for the poster competition was awarded jointly to Murray Clelland for *Saturated fusion systems* and Simon Nickerson for *Lost in a sporadic group*.

Professor Kirwan expressed the thanks of the Society to the local organiser and the speakers for putting on such an excellent meeting.

After the meeting an open discussion on the LMS-IMA Frameworks Study Initiative was led by Mr P.R. Cooper, Executive Secretary of the London Mathematical Society, and Mr D. Youdan, Executive Director of the Institute of Mathematics and its Applications.

A dinner was then held at Staff House, University of Birmingham.

LMS MIDLANDS REGIONAL MEETING 2005

The Midlands Regional Meeting of the London Mathematical Society was held on Wednesday 18 May in the Watson Building at the University of Birmingham. The meeting was opened by the President, Frances Kirwan, who then formally admitted three members to the Society.

Dr Chris Parker introduced Professor Bob Oliver of Université Paris 13, who gave the Fröhlich Lecture on *p-local structure of finite groups and of their classifying spaces*. He explained his proof of the Martino-Priddy conjecture, which states that two groups have the same *p*-local structure if and only if their classifying spaces have the same *p*-local structure. The proof makes use of the theory of saturated fusion systems and their associated centric linking systems, which were the subject of the three-day LMS Workshop which followed the Regional Meeting.

The second speaker was Professor Timothy Gowers, who asked *Is there another way to explain mathematics?* Professor Gowers thought so, and explained that he was in the process of compiling a book to be entitled *The Princeton Companion to Mathematics*. He aims to collect, in one volume, a number of essays on various aspects of mathematics which would be of interest to experienced mathematicians, undergraduate students and the general public.

After the tea interval, Professor Stephen Smith from the University of Illinois in Chicago talked about *Cohomology decompositions from subgroup complexes of finite groups*. Building on the foundations provided by the work of Tits on buildings, and of Brown and Quillen on simplicial complexes of *p*-subgroups of a group, Professor Smith explained how the mod-2 cohomology of the sporadic groups may be decomposed by studying certain 2-local geometries.

Following the third talk there was an open discussion on the LMS-IMA Frameworks Study Initiative.

Throughout the afternoon there was a display of posters in the mathematics department, with a prize of £100 worth of Springer books to the best poster as judged by Professors Oliver and Smith. Postgraduates from many departments around the country entered, and all the posters were of a very high standard.

At the end of the meeting, many members enjoyed the conference dinner held in Staff House, during which the winners of the afternoon's poster competition were announced. It was decided that the prize would be split between two joint winners, Murray Clelland and Simon Nickerson, both from Birmingham.

For the subsequent three days there was an LMS Workshop on *Fusion systems, representation theory and groups*. This covered a number of topics including the use of fusion systems in representation theory, the classification of p-local finite groups, the construction of exotic *p*-local finite groups and the study of *p*-local compact groups. The workshop was attended by many recognised experts in the field including Bob Oliver, Ran Levi, Carles Broto, Markus Linckelmann, Stephen Smith and Andrew Chermak. The study of fusion systems and *p*-local finite groups is a fairly new and vibrant subject. Each talk presented new ideas and directions to be explored.

Murray Clelland
University of Birmingham

TURBULENCE, TWIST AND TREACLE

This meeting, which was supported by the London Mathematical Society, was held in celebration of the 70th Birthday of Keith Moffatt at the Isaac Newton Institute and the Centre for the Mathematical Sciences in Cambridge during 21-22 April 2005. All or

many aspects of Keith Moffatt's research interests were covered, including dynamics, fluid dynamics and magneto-hydrodynamics (MHD). Contributions came from colleagues, collaborators and former research students.

Papers on turbulence were given by Julian Hunt (UCL), the very first lecture, and by Uriel Frisch (Observatoire de Nice). Hunt spoke on applications in industry as well as on the fundamentals (and associated difficulties in our understanding), bringing in a relevant quotation from Dickens ('Our Mutual Friend') in connection with 'impulse of vortices'! Frisch discussed difficulties with an inconsistent (or consistent?) framework of locally homogeneous turbulence. Magnetic effects (with or without turbulence) formed the themes of R. Moreau (Grenoble), Juri Toomre (Boulder) and Renzo Ricca (Milan). Moreau spoke on MHD turbulence in the limit of small values of the magnetic Reynolds number, where phenomena similar to the famous Taylor diffusion emerged. Toomre enthused on magnetism in relation to our nearest star, while Ricca gave his account of magnetic knots and minimal braids.

Within the realms of fluid mechanics, instabilities of flow and associated emergence of singularities, there were contributions from Andrew Soward (Exeter), Jens Eggers (Bristol) and K. Bajer (Warsaw). Soward spoke on the problem of instabilities in the flow between two rotating spheres, a problem superficially similar to Taylor's flow between two rotating cylinders but with many grave differences, which the speaker elucidated. Eggers drew attention to singularities in flows at surfaces, especially in connection with electric jets and 'selective withdrawal of oil through water'. Bajer discussed his interests in tubes and sheets in fluids and the growing interest in the question of the development of singularities; he found, for example, that compressibility can be relevant.

In physiological fluid dynamics, Tim Pedley spoke on self-excited oscillations of collapsible tubes and showed instability diagrams somewhat reminiscent of those of Benjamin and Mullin for the Taylor cylinder problem; Moffatt's corner eddies cropped up also!

V. Vladimirov (Hull and York) discussed fluid/solid structure interactions, of importance for many applications, bringing in a host of mathematical icons (van der Pol, for example).

The final word in the title of the meeting was there in the contribution of John Hinch (Cambridge) who spoke about the 'honey-spoon problem', the prevention or otherwise of dripping. This topic had been dear to Moffatt's heart but formally dealt with a thin film on the periphery of a rotating cylinder; Hinch described several fascinating features including shock-like phenomena.

Twist was in a sense the subject of the lecture of Y. Shimomura (Keio, Yokohama), who spoke about the dynamics of a spinning (or even jumping!) egg, hard-boiled (or not). This aspect of dynamics is related to the Tippe Top and to the problem of a disk spinning on a surface but the speaker's lively lecture made it a high point, not least because this collaboration with Keith Moffatt brought out the contributions made by Moffatt in much joint work; in this case it is of recent origins, with papers in *Nature* and *Proc Roy Soc A* and even a description in the Daily Telegraph. Shimamura even managed a reference to the Trios performed (by the 'McIntyre Trio') at the David Crighton Memorial Concert on 18 May 2001.

The final lecture was a fine discourse by Keith Moffatt himself on drops and bubbles, on strained vortex sheets and on flows in corners. The meeting was a remarkable tribute to the contributions that Moffatt has made in several fields of Applied Mathematics. We are indebted to Michael Proctor, who led the organisation of the meeting, and to his colleagues for the excellent arrangements. Unfortunately, Professor Proctor was unable to attend due to illness. However, the Meeting was enjoyed by all who had the good fortune to be present.

Trevor Stuart
Imperial College London

PRIZE FOR MATHEMATICIAN'S PORTRAIT

A portrait of a mathematician has won the top prize at the Royal Society of Portrait Painters annual show. John Wonnacott's painting of Professor Bernard de Neumann won the £10,000 Ondaatje prize. Professor de Neumann has been an LMS member since 1981.

Dr Emery writes:

Bernard de Neumann was educated at the Royal Hospital School, and then Birmingham University. Following his MSc he joined Marconi Research Laboratories (MRL) at Great Baddow, Essex where he spent almost 25 years working as a 'pure' applied mathematician. His work included modelling Concorde, in order to show that it could land safely, and modelling various missile systems. Whilst there, he became interested in the mathematics of reliable systems and the optimal logistics of supporting military and large civil operational systems.

In 1986 he was made an Honorary Visiting Professor in the Mathematics Department at City University, London, later joining the department as a Professor in 1988. In 1989 he was appointed Research Professor at City in the Centre for Software Reliability.

He left City in 1995 to join the Ministry of Defence, especially to work on a problem that he had become interested in whilst he was at Marconi Research Laboratories. He retired in 1999 becoming, for a while, a non-executive director of the Essex Health Authority. He now devotes much of his time to researching Naval History.

I worked for Bernard in 1980 during his time at MRL where I spent a year's sabbatical leave and was later involved with him in a NATO Advanced Study Institute on Electronic Systems Effectiveness and Life Cycle Costing organised by Bernard's boss at that time,

Joseph Skwirzynski. Bernard is one of those rare people who enriches those around him with his companionship and profound understanding. I was therefore delighted to see John Wonnacott's portrait of Professor Bernard de Neumann which recently won the Ondaatje prize.

David Emery
Staffordshire University

Professor de Neumann writes:

John Wonnacott CBE is a famous British artist noted for his landscape/seascape paintings – in fact he is now considered Britain's best landscape painter since John Constable.

Seventeen years ago, or so, I was waiting for a train at Chalkwell Station when a stranger came up to me and asked if I was Professor de Neumann, and when I said yes, he said "would I mind if he painted my portrait?" This is not a request I'd expected to receive, but after some discussions on the train revolving around his explanation of his special interest in ultra-wide-angle landscapes, and my reconciling this with projective geometry, I agreed to sit for him. John has now painted about a dozen portraits of me, and they hang in such places as Beverly Hills USA, Greenwich Village USA, Sydney and the Tate (British) and National Portrait Gallery in London. John rather generously says that he learned his portraiture skills from painting me, and about two years ago told me that there was something special about his latest portrait. In fact, in a famous recent painting to commemorate the Queen Mother's 100th birthday, John painted a huge picture (12 feet high!) of the Queen Mother surrounded by the Queen, Duke of Edinburgh, Prince Charles and his two sons and the corgies. This picture was constructed using techniques he developed and learnt from painting me and another model.

About six months ago he told me that the latest portrait of me was being entered for the Royal Society of Portrait Painters annual show in The Mall. On 26 April he phoned me asking if I could attend The Mall Galleries the next day for a "photo opportunity and Press Conference", as he (with my portrait) had won a prize. It transpired that he had won the top prize of the Ondaatje Prize for Portraiture of the RSPP (£10,000 + a gold medal). The prize was presented by the Duke of Kent.

Bernard de Neumann

HERBERT JAMES GODWIN

Professor Jim Godwin, who was elected a member of the London Mathematical Society on 15 December 1949, died on the 4 April 2005. Born in Wiltshire, he was the only child of a farmer. At the age of 9 he won a scholarship to Bristol Grammar School. A further scholarship took him to Trinity College, Cambridge in 1941. He obtained a first class in Part II of the Mathematical Tripos. During the war he was drafted into the Ministry of Supply, working on statistical and mathematical problems. It was during this period that he met his future wife Sheila Mayer, and they married in 1947. When the war ended he was appointed to a lectureship in Mathematics at University College, Swansea.

In 1968 Professor Godwin established a new Department of Statistics and Computer Science at Royal Holloway, University of London.

His main research area was in a branch of number theory called Aliquot Sequences. These depend on the sum of the positive divisors of a number, excluding the number itself: the process is iterated to form a sequence. It is an open question whether these sequences always cycle, or end in one. He published his first paper as an undergraduate and continued active research until his death this year. He published over 80 papers.

After a long and happy marriage his wife Sheila died in 2003. He is survived by his son William and his daughter Freida.

Professor Godwin was extremely courteous and well liked. To sum up his life in a single phrase, he was a scholar and a gentleman.

Alan R. Davies
Dept of Computer Science
Royal Holloway, University of London

LONDON MATHEMATICAL SOCIETY

POPULAR LECTURES 2005

Royal Institution, London – Friday 15 July
Manchester University – Wednesday 28 September

Dr Joan Lasenby

The Mathematics of Shrek

'How does mathematics, coupled with immense computational power, produce the stunning visual effects in movies like Shrek and Toy Story?'

Dr Alan Slomson

What Computers Cannot Do

'Computers can solve many mathematical problems. But, no matter how powerful they become, mathematics tells us there are limits to their problem-solving ability.'

LONDON (Royal Institution, 21 Albermale Street) Commences at 7.00 pm, refreshments at 8.00 pm, ends at 9.30 pm. Admission is free, with ticket. Apply by 8 July to Lee-Anne Taylor, London Mathematical Society, De Morgan House, 57-58 Russell Square, London WC1B 4HS (email: taylor@lms.ac.uk). A stamped addressed envelope would be appreciated.

MANCHESTER (Ruthersford Theatre, Schuster Building, Brunswick Street) Commences at 6.30 pm, refreshments at 7.30 pm, ends at 9.00 pm. Admission is free. Enquiries to Catherine Fox, Department of Mathematics, University of Manchester, Oxford Road, Manchester M13 9PL (tel: 0161 306 4013, email: catherine.fox@manchester.ac.uk).

BOOK REVIEW

M.C. Escher: Visions of Symmetry by Doris Schattschneider, Thames & Hudson, ISBN: 0 500 511691, pp 354, £19.95.

Escher's fascination with the world of symmetry has always endeared his art to mathematicians. We can't hope for a better illustrator to bring alive some of the great stories of mathematics: the beautiful pictures he produced which illustrate the 17 different plane symmetry groups, his pictures of hyperbolic space where devils and angels disappear into the infinite edge of the disc, his ants crawling endlessly around the Möbius strip.

If anyone is looking for a book which collects together the best of Escher's art then Doris Schattschneider's book M. C. Escher: Visions of Symmetry is a must. John Conway once described to me how he has the book open on his piano and tries to ration himself to one illustration a day. If he does feel the temptation to treat himself to more than one illustration then he always insists on leaving the room and entering again before he allows himself to turn the page.

The illustrations are matched by an equally fascinating commentary from the author. This provides a complete analysis of the different symmetry groups that are hidden behind each illustration together with biographical details to explain Escher's intellectual and artistic journey. Escher's most popular tilings are those involving rotational symmetry whilst simple reflection groups like pm, reflections in two parallel lines, hardly get a look in. The first edition was published in 1990 but this year sees a new edition released with new material. This mainly consists of a new 'Afterword' which documents the developments since the first publication and probably doesn't justify forking out again for another edition. But those who are buying for the first time will enjoy the extra section.

Although a book can give some inkling of an artist's work, nothing beats seeing the artist's originals. On a recent trip to Holland I took the opportunity to go to the new Escher Museum in Den Hague which opened in 2002. Escher's work is housed in a beautiful small eighteenth century palace and the building itself is worth the visit. My nine-year old son particularly enjoyed the virtual reality exhibit housed at the top of the museum which allows visitors to immerse themselves in Escher's paradoxical worlds. I couldn't get my two-year old twins out of Escher's magic chamber where proportions help create a world where I was dwarfed by my children. Escher would have appreciated their symmetry even if the rather prim museum assistants didn't.

For me the highlight was seeing in the flesh a beautiful icosahedral tin box designed by Escher for the 75 anniversary of the Dutch company Verblifa. I often use a picture of the box in my talks about group theory. Escher tessellates the box with a design of shells and star-fish but introduces a twist in the star-fish to destroy the reflectional symmetry of the undecorated icosahedron. The resulting symmetry group of Escher's box is the alternating group A5, the first non-abelian group in Conway *et al*'s Atlas of simple groups.

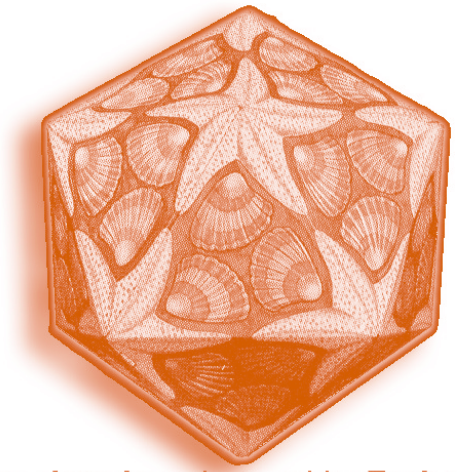
Another interesting part of the exhibition was Escher's early work depicting Italian landscapes. The illustrations bring alive the breathtaking Amalfi coast with its cliffs and strange rock formations. The towns that hang to the side of the cliffs leap out of the pictures. This is a very 3 dimensional world that Escher was trying to capture. With the rise of the fascists in the 1930s Escher left Italy and returned to his native Holland. The obsession with tiling the plane was (Escher explained) his reaction to the challenge of the flat 2-dimensional landscape that surrounded him in Holland. The transition from his early work to the Escher we are familiar with is captured in a woodcut dated May 1937 called Metamorphosis. On the left of the illustration is the coastal town of Atrani.

But as the picture evolves across the canvas, the cube shaped buildings of the town morph into a hexagonal tiling of 2-dimensional Chinese boys.

Another woodcut Metamorphosis II expands on this theme of transition in Escher's work and stretches for some 12 feet. The enigmatic piece is brought to life in a short film made by Michelle Emmer. Emmer is the editor with Schattschneider of a volume of essays about Escher's work that grew out of a centenary meeting in Rome in 1998. The volume includes a CD which includes lots of fantastic visual material to accompany the book including Emmer's short film of Metamorphosis II. The volume makes a fascinating compliment to Schattschneider's book. It includes essays by artists inspired by Escher's legacy, educationalists who have used Escher's works in the classroom to bring alive mathematical ideas and essays on some of the mathematics behind Escher's prints including two articles by Coxeter. Coxeter was influential in Escher's move in the 1950s from the Euclidean plane into tilings of the hyperbolic plane.

One of the most fascinating articles is by Hofstader of Godel, Escher, Bach fame. It includes a wonderful story of Mick Jagger's request to 'Maurits' to design some illustrations for a forthcoming album cover. Escher was somewhat dismayed by the appropriation of his work by the 60s hippy movement. But worse still was Jagger's familiar tone: 'please tell Mr. Jagger I am not Maurits to him, but Very sincerely, M.C. Escher.' But the main thrust of Hofstadter's essay is a defence of the artistic value of Escher's work. The artistic world has always been rather snobby about Escher's work, complaining that the predictability of the mathematics detracts from its artistic value. But the books of Emmer and Schattschneider together with the museum in Den Hague are a wonderful celebration of why Escher remains a favourite amongst many mathematicians and hippies alike.

Marcus du Sautoy
University of Oxford



Chocolate box designed by **Escher**
Its symmetries are one of the first building blocks in the periodic table of symmetry

LMS SPITALFIELDS DAY REPORT

Groups of Finite Morley Rank

This Spitalfields Day took place at the Isaac Newton Institute on 16 March 2005 as part of the programme on *Model Theory and Applications to Algebra and Analysis*. The day was aimed at a wide mathematical audience (graduate students working in algebra, model theory, number theory were especially welcome). The talks gave an accessible first-hand account of recent developments in classification of simple groups of finite Morley rank and their surprising relation to number theory, quantum groups and the classification of finite simple groups. There were about 60 participants, about 20 of whom came to the Newton Institute especially for that day. There was a large group from Oxford University, as well as participants from Queen Mary, St Andrews, Nottingham, Birmingham, Leeds, Manchester and Mons (Belgium).

Tuna Altinel (Université Lyon) gave the opening talk *The programme for classification of groups of finite Morley rank*, a general introduction to the topic of the day, with some ideas for the future. The Morley rank is a notion of dimension defined on definable sets, and which behaves very much in the way algebraic dimension (of a variety) behaves in algebraic geometry.

The *Algebraicity Conjecture* states that a simple group of finite Morley rank is in fact the set of K-rational points of a simple algebraic group defined over an algebraically closed field K. This conjecture was first stated thirty years ago, and important advances were made in the past few years. The current state of progress was then described.

Altinel explained the important role of involutions in the study of these groups, and how the strategy of the proof gets some inspiration from CFSG, the Classification of Finite Simple Groups, a monumental work which was completed 20 years ago. As with finite simple groups, one attempts to prove the result by induction, and the study of the 2-Sylow subgroups is fundamental. The case when the 2-Sylow subgroups are infinite and have bounded exponent is now complete: a simple group of finite Morley rank with infinite 2-Sylow subgroups of bounded exponent is indeed the set of rational points of an algebraic group over an algebraically closed field of characteristic 2.

The two remaining cases of the conjecture are therefore the 'odd type case' (the connected components of the 2-Sylow subgroups are abelian divisible, case which should correspond to a field of characteristic not equal to 2), and the 'degenerate type' (the 2-Sylow subgroups are finite, case which one wishes to eliminate).

Gregory Cherlin (Rutgers) discussed the geometric aspects of the proof, and how the study of complex reflection groups plays a role in his talk *Ultraproducts and complex reflection groups*. After reviewing the role of Coxeter groups and Dynkin diagrams in the structure of simple algebraic groups via the Curtis-Tits theorem, he sketched a proof of a Generic Identification Theorem for groups of finite Morley rank, in which crystallographic Coxeter groups were identified via an ultraproduct representation combined with the Shepherd-Todd classification of complex reflection groups.

Eric Jaligot (Université Paris 7) explained some of the tools recently developed, in particular the notion of unipotent subgroups and their good behaviour in his talk *Good tori and bad fields*. He also introduced Carter subgroups (a definable, connected subgroup which is nilpotent and of finite index in its normaliser). These subgroups are now known to exist in all groups of finite Morley rank. He also discussed some genericity results, notably on 'good tori', a very natural concept, and which has given some surprising results.

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One of the potential source of counterexamples to the Algebraicity Conjecture is the possible existence of 'bad fields', i.e., an algebraically closed field with a distinguished predicate for an infinite proper subgroup of its multiplicative group, and which has finite Morley rank. It is believed that these fields do not exist in positive characteristic, but that they do exist in characteristic zero. Boris Zilber (Oxford) with a talk entitled *The algebraicity conjecture: some thoughts against* explained how the existence or non-existence of bad fields had some relation with the 'Zariski structures' that he and Ehud Hrushovski introduced in the 90s, and with the exotic strongly minimal structures built by Hrushovski. He concluded his talk with a description of non-standard Zariski structures, and their surprising connection to 'Quantum tori'.

The last talk of the day was given by Alexandre Borovik (Manchester) on *Finite group theory: the next generation*. After recalling the role played in the study of groups of finite Morley rank by a wide range of subjects involved in the CFSG, he observed that there are a number of competing strategies for the finite Morley rank case, all equally powerful, but based on different aspects of the proofs known (or under construction) in the finite case. He then proceeded to describe briefly the various existing proofs (or attempts toward a proof) of the CFSG: the first, second and third generation.

He also expressed the belief that the notion of connectedness, which plays a very important role in the study of groups of finite Morley rank, might have an analogue for finite simple groups, and gave a possible definition. He then proceeded to list a series of results known to be true for simple groups of finite Morley rank, and proposed the corresponding (translated) questions for finite simple groups.

Zoé Chatzidakis

DE MORGAN AT FITZWILLIAM

Members may recall an article in the October 2003 *Newsletter* about the De Morgan Centre which commemorates William De Morgan, the eldest son of Augustus De Morgan.

The Fitzwilliam Museum, Cambridge, has some superb bowls and vases by William De Morgan (1839-1917), their shimmering, metallic glazes inspired by the rich coloration of Italian majolica, and the exotic iridescence of Iznik ware. De Morgan's efforts to master these glazes were not without cost. The home-made kiln in his first workshop in Fitzroy Square set fire to the roof. Undaunted, De Morgan continued his hazardous experiments in later workshops, his idiosyncratic tiles of stylised – and often startled – birds and animals enjoying particular success. Lewis Carroll found them a fitting adornment to the rooms in Christ Church, Oxford, where he wrote *Alice's Adventures in Wonderland*, while the Tsar of Russia commissioned a set of tiles for his yacht. De Morgan supplied Morris & Co. with decorated ceramics for years, and in 1882 moved from his chaotic workshop in Chelsea to a purpose-built pottery close to William Morris's new premises at Merton Abbey, near Wimbledon. De Morgan and Morris working alongside each other, in friendship and collaboration, were the stuff of which the Arts and Crafts movement was made.

Fitzwilliam Museum

IF YOU COULD TEACH THE WORLD JUST ONE THING...

On 10 May a symposium was held at the Royal Institution with this intriguing title. It was an event organised by the RI together with *spiked** and NESTA (the National Endowment for Science, Technology and the Arts).

We started with short clips from a film in which some scientists told us what they thought. Apparently some 250 scientists and scientific editors were interviewed for this survey. Marcus du Sautoy, wearing his number 17 football shirt (as indeed he was for real, for he was in the capacity audience), spoke up for Euclid's proof that there is an infinity of primes, and bemoaned the fact that there aren't enough teachers to put across the beauty, joy and excitement of mathematics. Lisa Saksida, a neurophysiologist, would hope to destroy the myth of the mind/brain dichotomy, arguing that they are inseparable. Mark Modownik, a materials scientist, spoke up for the new alchemy, looking at the ways in which we can nowadays transform one material into another and finally another neuroscientist, Mark Lythgoe, argued in favour of everyone understanding how we view the world differently because of the impact of science and the scientific method. In particular he raised the question of whether this approach can tell us what consciousness is.

We then proceeded to the live part of the evening – a panel discussion chaired by Vivienne Parry, the writer and broadcaster. Each panellist spoke for 5 minutes and then discussion was open to the floor. Simon Singh (no introduction necessary!) spoke of the importance of the scientific method and referred to the history of theories about the 'Big Bang' in matching theory to observed data. Philip Ball, a consultant editor with *Nature*, discussed the non-democratic nature of science: all may have ideas and contribute, but in the end some ideas are right and some are wrong. He suggested that if people understood the process of healthy scepticism involved in hypothesising and testing – and if scientists were better at explaining these processes – more would accept science as the best way of understanding how the world works.

Tracey Brown is a sociologist and director of 'Sense About Science'. She was concerned about both the underuse and the overuse of science in public debate: underuse in that scientific advice is often watered down so that a generally ignorant public can digest it; overuse in that it is used to pre-empt debate which should more properly fall into the realms of morals or ethics. She suggested that scientists, while continuing to show the beauty and excitement of their subject, should not thereby be seduced away from stating what is true. Sir Colin Berry is emeritus professor of pathology at Queen Mary University of London. His view is that the public look for certainty from scientists, but the scientific process is not intuitive and each step must be clearly demonstrated. Certainty is not always possible. Since 'public opinion' gets turned into functioning law two-thirds of the time, and much of it is formed by 'focus groups' we need to be sure that the public is well informed.

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There was then an open debate. The quantifying of risk was clearly something which exercised many in the audience, as was the over-protective attitude to science in schools. Young people no longer have the opportunity to do any experimentation and are being turned off science, which is creating a vicious spiral of shortage of teachers for the future. (Though whether we need to go as far as 'the best experiments are those in which there is a strong probability that the demonstrator may die' is perhaps a moot point!) Likewise in mathematics we need to extend beyond the narrow confines of the (National) curriculum to show the excitement involved. This again comes back to the supply of enthusistic, well-motivated (and well-remunerated) teachers.

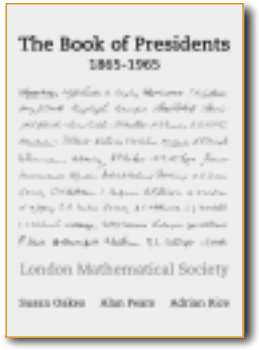
Other points made included the benefits of 'real' scientists, engineers and so on going into schools to enthuse students; the interconnectedness of science and technology – ideas from the scientists being developed by the technologists, then providing new opportunities for science to move forward; the fact that people seem more impressed by technology than by science; the 'disprovability' of scientific theory; "science is just another opinion/oh, no it isn't ..."

And so the debate continued as we went out into Albemarle Street at the end of a very stimulating evening.

Martin Perkins

*www.spiked-online.com

The Book of Presidents
1865-1965



The London Mathematical Society was established during the energetic and confident heyday of Victorian Britain. Although several learned societies pre-date it, the LMS can claim to have led the way in a number of respects: firstly, in the rigorous reviewing standards it set from the outset, with two independent reviewers being appointed for each paper submitted to the Proceedings; and secondly, in its acceptance of women as full members, which was progressive for its day.

This volume, which contains over eighty photographs, concentrates on the first 100 years of the Society's existence and traces its evolution through its Presidents and De Morgan Medallists, each of whom was a pre-eminent mathematician of his or her day. Through them we learn which branches of the discipline were in vogue at any particular time, and come to appreciate the Society's rich history.

The Book of Presidents 1865-1965 is available from the London Mathematical Society. Email lms@lms.ac.uk to place your order. The LMS members price is £15, the full price is £19.

EPSRC COMPUTATIONAL DIFFERENTIAL EQUATIONS

LMS/EPSRC Short Course

University of Manchester, 11–16 September 2005
Organiser: Professor Nicholas J. Higham

Differential equations (DEs) are ubiquitous in science and engineering, being used for all kinds of modelling and prediction. The solutions to most DEs have no convenient explicit form and hence the *numerical solution* of differential equations is a subject of fundamental importance.

This course provides an overview of three important topics in the computational solution of DEs, covering theoretical and numerical aspects and practical computation in MATLAB. The lectures will be supported by laboratory classes. The course lecturers are:

- N.J. Higham (Manchester) *A brief introduction to MATLAB*
- L.N. Trefethen (Oxford) *Spectral methods for ODEs and PDEs*
- D.J. Higham (Strathclyde) *Stochastic differential equations and their numerical simulation*
- D.J. Silvester (Manchester) *Finite element methods for elliptic PDEs*

An opening guest lecture will be given by P.K. Jimack (Leeds).

The course is aimed at mathematics PhD students working in any area that requires computational solution of DEs; it assumes a familiarity with numerical analysis but not a strong background in the subject. Experience in programming is assumed, but it is not necessary for the students to be familiar with MATLAB; sample programs will be provided. For further information see: www.ma.man.ac.uk/~higham/cde05.

The registration fee is £100. The accommodation costs for all UK-based research students are covered by EPSRC. Participants must pay their own travel costs. EPSRC-supported students can expect that their registration fees and travel costs will be met by their departments from the EPSRC Doctoral Training Account. Postdocs and non-UK students will be required to pay their own subsistence costs.

Application forms may be obtained from Isabelle Robinson, Administrative Officer, London Mathematical Society, De Morgan House, 57-58 Russell Square, London WC1B 4HS (email: robinson@lms.ac.uk, fax: 020 7291 9978) or an on-line form is available on the LMS website: www.lms.ac.uk/activities/research_meet_com/short_course/27_form.html.

Numbers will be limited and those interested are advised to make an early application. The closing date for applications is **Friday 15 July**. Completed forms should be returned to the Administrative Officer by email, fax or post (details above). All applicants will be contacted by the London Mathematical Society approximately one week after this deadline; we will not be able to give information about individual applications before then. Please do not send any money until we ask.

CALENDAR OF EVENTS

This calendar lists Society meetings and other events publicised in the *Newsletter*. Further information can be obtained from the appropriate LMS *Newsletter* whose number is given in brackets. A fuller list of meetings and events is given on the Society's website (www.lms.ac.uk/meetings/calendar.html).

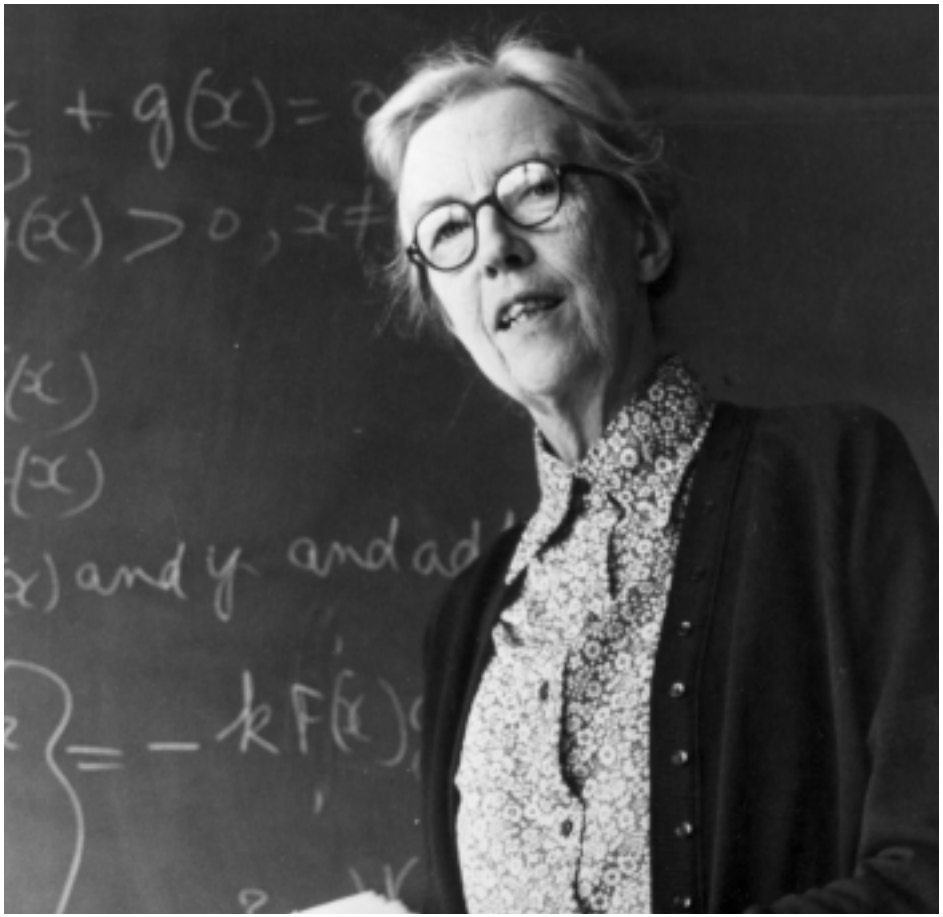
JULY 2005

4 Scalar Mixing in Fluid Flows & Mappings Meeting Exeter University (335)
4-8 Problems & Perspectives Symposium, Cadi Ayad Université, Marrakech (335)
4-8 Pure Model Theory Workshop, East Anglia University (336)
4-8 Coagulation-Fragmentation Process ICMS Workshop, Edinburgh (336)
4-9 Nonlinear Wave Phenomena LMS/EPSRC Short Course, Reading University (337)
7-9 International Colloquium, Monst-Hainaut University, Belgium,
8 LMS Northern Regional Meeting, York (339)
8-10 Algorithms & Complexity Workshop, Durham University (338)
10-14 Mathematical Modelling and Applications Conference, City University, London (321)
10-15 British Combinatorial Conference, Durham University (329)
10-16 Algebraic Topology LMS/EPSRC Short Course, University of Wales, Swansea (337)
11-15 Inverse Problems in Engineering Conference: Theory & Practice, Cambridge University (320)
11-15 Model Theory, Algebraic & Analytic Geometry Euro Conference, INI, Cambridge (332)
11-22 Equidistribution in Number Theory NATO ASI Summer School, Montréal, Canada (334)
15 LMS Popular Lectures, Royal Institution, London (339)
17-14 Aug Atlantic Association for Research in the Mathematical Sciences Summer School, Dalhousie University, Canada (333)
18-20 Albert Einstein Century International Conference, Paris, France (332)
22-28 International Mathematics Competition for University Students, American University, Bulgaria (334)
22-1 Aug Geometry, Conformal Field Theory and String Theory Durham Symposium, Durham University (333)
25-29 Gregynog Workshop on Computational Techniques in Spectral Theory & Related Topics, Gregynog Hall, Powys (320)
30-6 Aug Groups St Andrews 2005 Conference, St Andrews University (332)

AUGUST 2005

1-5 Pattern Formation Training Course, INI, Cambridge (335)
1-17 Representation Theory in Differential Geometry & Physics Workshop, Benin Republic, West Africa (338)
2-12 Operator Theory and Spectral Analysis Durham Symposium, Durham University (333)
5-11 Mathematical Logic Conference, Budapest, Hungary (335)
8-12 Developments in Experimental Pattern Formation Conference, INI, Cambridge (335)
17-21 Pacific Rim Conference on Mathematics, Fudan University, China (334)
18-19 New Directions in Numerical Relativity INI Satellite Workshop, Southampton University (335)
20-22 Algebra, Geometry, Analysis & Mechanics Conference, Islamabad, Pakistan (338)
21-27 Global General Relativity Conference, INI, Cambridge (334)
24-26 Model Reduction & Coarse-Graining Approaches for Multiscale Phenomena Workshop, Leicester University (338)
30-1 Sep Recent Advances in Non-linear Mechanics, IMA Conference, Aberdeen University (330)

MARY LUCY CARTWRIGHT
DE MORGAN MEDALLIST
1968



On 20 June 1968, the President announced that the De Morgan Medal was awarded to Miss Cartwright. He reviewed her work on interpolatory function theory, entire functions, boundary properties of functions defined in the disc, non-linear differential equations and the theory of cluster sets. He made particular mention of her work on the behaviour of a meromorphic function in the neighbourhood of a sufficiently thin set of singularities and her theorems on level curves of entire functions. He concluded: 'Miss Cartwright's achievements fully justify her reputation as one of the leading classical analysts of her time.'